

REMARKS

This paper is being presented in response to the final official action dated October 19, 2005, wherein: (a) claims 1, 3, and 9 were pending; (b) claims 1 and 9 were rejected under 35 USC § 102(b) as being anticipated by Meguro et al. U.S. Patent No. 6,538,847 ("Meguro"); and, (c) claim 3 was rejected under 35 USC § 103(a) as being obvious over Meguro in view of Nepela U.S. Patent No. 6,330,131 ("Nepela"). Reconsideration and withdrawal of the rejections are respectfully requested in view of the following remarks.

The advisory action of March 6, 2006, is acknowledged.

This paper is timely filed as it is accompanied by a petition under 37 CFR § 1.136(a) for an extension of time to file in the second month, and payment of the required extension fee.

I. Brief Summary of the Amendment to Claim 1

Claim 1 has been amended for clarity to recite "a diamond-like carbon protective film" instead of "a protective film," and that the film is formed directly on at least the surface of the MR head portion facing a recording medium. Support for the amendment may be found, for example, in the specification at ¶¶ 10, 14, and 15. No new matter has been introduced by the amendments.

II. The 35 USC § 102(b) Rejection Is Traversed

Claims 1 and 9 were rejected under 35 USC § 102(b) as being anticipated by Meguro. See p. 2 of the action. Reconsideration is requested.

A. Proper Basis for a § 102(b) Rejection

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). The PTO must compare the construed claim to a single prior art reference and set forth factual findings that "each and every limitation is found either expressly or inherently [disclosed] in [that] single prior art reference." *Celeritas Techs. Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1360 (Fed. Cir. 1998). Additionally, "[t]he identical invention must be shown in as complete detail as is contained in the patent claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

When the meaning of a term in an allegedly anticipatory primary reference is unclear, additional references or other evidence can be used to show the meaning of the term used in the primary reference. See MPEP § 2131.01(II). Specifically, extrinsic evidence may be considered when it is used to explain, but not expand, the meaning of a reference as

interpreted by a person of skill in the art. *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991). For example, the Board of Patent Appeals and Interferences (the "Board") in *Ex parte Schwartz* considered whether a reference that described "filling [a pretzel] dough with a filling composition" anticipated a claim element requiring a "filling composition [to be] 'substantially enclosed by the [pretzel] dough.'" *Ex parte Schwartz*, 2000 WL 33224719, *3 (Bd. Pat. App. & Interf. 2000) (Appeal No. 2000-0602) (unpublished opinion). The allegedly anticipatory reference did not define "filled" or "filling." *Id.* The Board clarified the dispute as follows:

The real issue is: What does "filled with ... filling" mean to one skilled in the art of pretzel making? . . . Both the Examiner and Appellant are invited to add evidence, such as publications, patents and declarations, regarding the meaning to one of ordinary skill in the art. Note that extrinsic evidence can be used to explain, but not expand, the meaning of the reference when determining what an anticipatory reference describes to one of ordinary skill in the art.

Id. (citing *In re Baxter*, 952 F.2d at 390). The Board remanded the case to the Examiner, inviting the "Examiner and Appellant . . . to place evidence and argument into the record which would shed light on the meaning of 'filled', as used in [the allegedly anticipatory reference], to one of ordinary skill in the pretzel art." *Id.* at 5.

B. Extrinsic Evidence Indicates that Meguro Does Not Disclose a Protective Film Having a Thickness of 10 Å – 30 Å Formed on the Surface of a Magnetoresistive Head

Meguro twice mentions the use of a DLC protective film to prevent corrosion of the medium-facing surface of a head slider. Meguro, col. 5, lines 22-34; and, col. 9, lines 24-29. Because its only mention of a thickness is "several nanometers" (Meguro, col. 9, lines 27), Meguro fails to disclose the protective film with sufficient detail as compared to the claimed thickness of 10 Å – 30 Å. *Richardson*, 868 F.2d at 1236. Resort to dictionaries in the present case is unproductive, based on the differing definitions. See p. 3 of the action; pp. 3 and 4 of Applicant's "Amendment A." Even if the U.S. dictionary were to control, a range of "several nanometers" defined as "an indefinite number more than two and fewer than many" (see p. 3 of the action) could hardly be considered enabled by Meguro. See generally MPEP § 2121.

Similarly, Meguro discloses a protective film "formed over the entire medium-facing surface." Meguro, col. 9, lines 24-26. However, based on this sparse disclosure alone, it is unclear whether Meguro discloses a "protective film . . . formed on at least the surface of [a] MR head portion facing a recording medium" (claim 1) or whether a silicon-containing adhesive layer is interposed between the protective film and the medium-facing surface.

Based on extrinsic evidence, Meguro's disclosure that "a protective film (not shown) of diamond-like carbon (DLC), etc. is formed over the entire medium-facing surface in a thickness of several nanometers" (col. 9, lines 24-29) should be interpreted by a person of skill in the art of manufacturing thin-film magnetic heads as describing a protective layer of 5 or more nanometers (i.e., at least 50 Å) adhered to a magnetoresistive head using a silicon-containing adhesive layer.

The applicants discuss a previous approach to forming a hydrogen-containing amorphous carbon film with respect to Japanese Patent Application Kokai No. 4-276,367. See ¶ 4 of the specification. The equivalent to this publication is Chang et al. U.S. Patent No. 5,175,658 ("Chang"), which was considered by the examiner in the official action dated June 9, 2005. Chang discloses a protective coating for a magnetic head slider having a thickness of 250 Å or less. Chang, col. 2, lines 31-41. The protective coating is attached to the magnetic head slider using an intermediate silicon adhesion layer. Chang, col. 2, lines 37-41. Chang clarifies that the lower limit of the protective layer is about 50 Å:

The layer of hydrogenated amorphous carbon 26 is deposited to a thickness of about 50-1000 angstroms. A layer of hydrogenated amorphous [*sic*] carbon 26 as little as 50 angstroms thick has been shown to provide a significant improvement in both wear and corrosion rates. However, a thicker layer is preferable since it provides increased protection, so the thickness is chosen based on the permissible increase in spacing between the magnetic head and the magnetic recording medium.

Chang, col. 5, lines 29-37. Thus, in view of Chang, a skilled artisan would not have interpreted Meguro's disclosure of "several nanometers" to be less than 50 Å.

The applicants also discuss a previous approach to forming a silicon-containing carbon film with respect to Japanese Patent Application Kokai No. 10-275,308. See ¶¶ 7-8 of the specification. In this case, a protective layer less than 70 Å is found to impart insufficient corrosion resistance. See ¶ 8 of the specification. No intermediate adhesive layer is used. See ¶ 7 of the specification.

Similarly, Nepela does not suggest an interpretation of "several nanometers" to be less than 100 Å. While Nepela discloses hard friction-lowering DLC layers of 500 Å to 3000 Å (col. 2, lines 49-53), it also discloses thinner protective DLC layers ranging from 0 Å to 300 Å (col. 2, lines 58-60; col. 3, lines 34-47; and, col. 3, lines 64-67), 100 Å to 400 Å (col. 3, lines 6-10), and 100 Å to 300 Å (col. 5, lines 7-10). These DLC layers may be adhered to the air-bearing surface of a slider using an intermediate silicon adhesive layer. Nepela, col. 3, lines 52-56. Even though Nepela discloses a DLC protective layer with a "thickness" of 0 Å, it is clear that this lower limit of the range is meant to encompass cases where the DLC protective layer is *absent*, not merely very thin:

[The protective layer thickness] is in the range of about 0 to 300 Angstroms when DLC layers are used for magnetoresistive devices or other devices which require corrosion or smearing protection. For inductive heads which do not require corrosion or smearing protection, [the protective layer thickness] may be zero.

Nepela, col. 3, lines 35-40. Similarly, in discussing an alternate embodiment, Nepela discloses regions of the slide rails where the DLC protective layer is *either* absent or present as a "substantially thin layer of about 100-400 Angstroms." Nepela, col. 3, lines 6-9. These regions are analogous to those discussed relative to the first embodiment which had protective layer of 0 Å to 300 Å. See generally Nepela, col. 2, lines 49-67; col. 3, lines 1-16; and, Figs. 1-2. The only claimed thickness of the DLC protective layer is 100 Å to 300 Å. Nepela, col. 5, lines 7-10. Thus, in view of Nepela, a skilled artisan would not have interpreted Meguro's disclosure of "several nanometers" for a protective layer (when present) to be less than 100 Å.

C. Meguro Does Not Disclose a Protective Film Formed Directly on the Surface of a Magnetoresistive Head

Claim 1 now recites that the protective film is formed directly on at least the surface of the magnetoresistive head portion facing a recording medium. The recited structure excludes the presence of an adhesion-promoting interlayer, as conventionally used in such heads and described in the background section of the present application. It is surprising indeed that a protective film as thin as recited in the present claims exhibits sufficient adhesion to a recording head, without the aid of a conventional interlayer.

The applied reference is totally silent as to the physical structure of the head and protective film, and thus certainly cannot anticipate or render obvious the claimed structure.

D. The § 102(b) Rejection Is Traversed

It is respectfully submitted that the claims 1 and 9 are not anticipated by Meguro. The disclosure of a protective layer "formed over the entire medium-facing surface in a thickness of several nanometers" is sufficiently vague to warrant the consideration of extrinsic evidence to determine what Meguro actually discloses. See *In re Baxter*, 952 F.2d at 390. The extrinsic evidence indicates that a person of skill in the art would have interpreted this disclosure to include a protective layer of at least 50 Å adhered to a surface using an intermediate silicon-containing layer. Even when the extrinsic evidence describes a protective layer without a intermediate adhesive layer, the thickness of the protective layer of is at least 70 Å. In any event, Meguro's disclosure certainly does not meet the recited range of 10 Å to 30 Å, either explicitly or inherently, nor does it even remotely teach that such a protective layer is formed directly on the surface of an MR head facing a recording medium.

Therefore, Meguro does not disclose all recited features of claim 1 to a person of skill in the art. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. The 35 USC § 102(a) Rejection Is Traversed

Claim 3 was rejected under 35 USC § 103(a) as being obvious over Meguro in view of Nepala. See pp. 2-3 of the action. As discussed above, neither Meguro nor Nepal discloses a protective film having a thickness of 10 Å to 30 Å formed directly on the surface of a magnetoresistive head portion facing a recording medium. See Section II.B above. Therefore, their proposed combination fails to disclose all recited features of any of claims 1, 3, and 9. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

CONCLUSION


In view of the foregoing, entry of the amendment to claim 1, reconsideration and withdrawal of the rejections, and allowance of all pending claims 1, 3, and 9 are respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to contact the undersigned attorney.

Respectfully submitted,

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